

REMARKS

Enclosed herewith, is a Petition under 37 CFR 1.137(b) to revive this application that was unintentionally abandoned.

A Preliminary Amendment identified this application as a continuation of PCT International Application No.PCT/FR97/01232 filed July 8, 1997 which claims the priority of FR 96 08542 filed July 9, 1996. Accordingly, enclosed herewith is a certified copy of FR 96 08542 filed July 9, 1996 in support of the priority claim under 35 USC 119.

At paragraph 2 of the Office communication the examiner has indicated that the declaration is defective. A Declaration, signed by each of the named inventors and properly identifying the US application by the PCT International Application Number, was timely filed on October 26, 1999 in response to the Notification to File Missing Parts of Application, mailed August 26, 1999. The Declaration submitted was considered as satisfying the requirements for entry of the national stage under 35 USC 371 and was accepted by the Commissioner. The PCT International Application, which indicates the US as a Designated Office, uniquely identifies the US application. The applicant therefore believes that the Declaration as filed is not defective. The observations made by the examiner with respect to 28 USC 1748 are not applicable.

In response to paragraph 3 of the Office communication new drawings will be submitted upon allowance of the application.

In response to paragraphs 4 and 5 of the Office communication, pages 4 and 5 of the specification have been amended to remove the minor informalities identified by the Examiner. Both pages were amended following the suggestion of the Examiner in paragraph 4 of the Office Communication.

Claims 1 and 18 are rejected under 35 USC 112, second paragraph; claims 1, 6, 7, and 15 are rejected under 35 USC 103(a) as being unpatentable over Nields; claims 2 and 3 are rejected under 35 USC 103(a) as being unpatentable over Nields in view of Gerstenberger; claim 4 is rejected under 35 USC 103(a) as being unpatentable over Nields in view of Russ; claim 5 is rejected under 35 USC 103(a) as being unpatentable over Nields in view of Pratt; claims 8 to 14 are rejected under 35 USC 103(a) as being unpatentable over Nields in view of Kenet et al.;

claims 1, 6, 7, and 15 are rejected under 35 USC 103(a) as being unpatentable over Robb et al. in view of Mick et al.; claims 2 and 3 are rejected under 35 USC 103(a) as being unpatentable over Robb et al. in view of Mick et al. and Gerstenberger; claim 4 is rejected under 35 USC 103(a) as being unpatentable over Robb et al. in view of Mick et al. and Russ; claim 5 is rejected under 35 USC 103(a) as being unpatentable over Robb et al. in view of Mick et al. and Pratt; claims 8 to 14 are rejected under 35 USC 103(a) as being unpatentable over Robb et al. in view of Mick et al. and Kenet et al.; claims 16 to 19 and 21 are rejected under 35 USC 103(a) as being unpatentable over Robb et al.; and claims 19 and 20 are rejected under 35 USC 103(a) as being unpatentable over Robb et al. in view of Nields.

In regard to paragraphs 7 and 8 of the Office communication, the rejection of claims 1 and 18 under 35 USC 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention is respectfully traversed. Claim 1 has been amended to remove the informality identified in paragraph 5 of the Office Communication but is otherwise not further amended. The subject invention as claimed in claim 1, step c, relates to Figure 4 and is discussed in length in the "Detailed Description of the Invention". The method of the subject invention does not require extraction of the region of interest. As explained on page 6 as well as on pages 7, 8 and 12-14 a target pixel in the region of interest is selected in the selection step followed by a matching step in which a target window of chosen dimensional characteristics containing the target region of interest is generated around the selected target pixel. Thereafter, on the basis of gray-scale level values of the pixels in the target window, a first set of numerical values is determined for the target region of interest. In the second image, a set of pixels belonging to so-called candidate regions of interest appearing in the second images is determined and a second window containing the corresponding candidate regions of interest is generated around each of the selected pixels. For each candidate region, a second set of numerical values is determined on the basis of the gray-scale level values of the pixels in the associated second window. The region of interest homologous to the target region of interest is then identified followed by matching based upon comparison processing between the first set of numerical values and the second set of numerical values. Applicant does not believe that claim 1 requires further clarification.

Claim 18 has been amended to overcome the rejection based upon insufficient antecedent basis for the language referred to by the Examiner in line 8 of the claim. The last paragraph of claim 18 reads:

-- wherein the region homologous to the target region is selected as being the one based upon such ranking --.

The ranking criteria in claim 18 is discussed and supported on pages 19 and 20 of the specification. For all of the above reasons, the rejection of claims 1 and 18 under 35 USC 112, second paragraph should now be withdrawn.

In regard to paragraph 10 of the Office communication, the rejection of claims 1, 6, 7 and 15 under 35 USC 103(a) as being unpatentable over Nields, U.S. Patent No. 5,776,062 is respectfully traversed. Applicant submits herewith an English translation of the priority document to perfect Applicants claim based on foreign priority which gives Applicant an earlier effective filing date than Nields. Accordingly, Nields should be withdrawn as a reference and this rejection is now moot.

Further, the rejection of claims 2, 3, 4, 5, 8 to 14, 19 and 20 as set forth in paragraphs 11, 12, 13, 14 and 20 of the Office communication are also moot since these rejections are based on the Nields '062 and should be withdrawn.

In regard to paragraph 15 of the Office communication, the rejection of claims 1, 6, 7 and 15 under 35 USC 103(a) as being unpatentable over Robb et al., U.S. Patent No. 5,568,384, in view of the Mick et al., U.S. Patent No. 5,261,404, is respectfully traversed. Robb et al. depends upon an extraction step as explained in column 3, last paragraph, in which object contours are extracted from both the base and match images by using well-known image segmentation algorithms. The contours of the base images are stacked together to form three-dimensional base surfaces. The subject matter disclosed and claimed in the present application does not use this technique and the matching operation is different and based upon a correlation processing operation which may include a centered or uncentered normalized correlation or a normalized difference processing. In addition, claim 1 further requires matching a generated target window of chosen dimensional characteristics containing the target region of interest around the selected

target pixels. Contrary to the allegation of the Examiner, Robb et al. does not generate a target that contains the target region of interest around the selected target pixel. Robb also does not employ correlation processing. In addition, contrary to the allegation of the Examiner, Robb does not practice step (e). Robb et al. does not generate a second window having the same dimensional characteristics as the target window around each selected pixel. Instead, Robb et al. samples points from the extracted object contours based on the matched contour data to achieve image registration. This is a different methodology.

The correlation process as taught in Mick et al. is not used for a matching operation as disclosed and claimed by Applicant and Mick et al. does not teach the specifics of his correlation method. How then is one skilled in the art to combine Robb et al. and Mick et al. to arrive at the present invention without the benefit of hindsight or reconstruction of the teaching of the cited references? The Examiner has failed to establish a prima facie rejection under 35 USC 103(a). Accordingly, there is no basis for the allegation that claim 1 is obvious based on combining Robb et al. and Mick et al. The same arguments apply to claim 7.

For all of the above reasons, claims 1 and 7 are patentable over Robb et al in view of Mick et al taken individually or in combination. Claims 6 and 15 are dependent claims, which are believed patentable for the same reasons as given heretofore.

In regard to paragraph 16 of the Office communication, the rejection of claims 2 and 3 under 35 USC 103(a) as being unpatentable over Robb et al. and Mick et al. as applied to claim 1 and further in view of Gerstenberger, U.S. Patent No. 5,220,441 is respectfully traversed.

Claims 2 and 3 are dependent claims that depend from claim 1 and are believed patentable for the same reasons as given heretofore. Further, Gerstenberger does not teach the matching steps set forth in claims 1 and 7. The claims do not depend for their patentability upon the utilization of specified correlation algorithms but instead, depend upon a matching methodology, which is not taught in any of the cited references. Accordingly, the rejection of claims 2 and 3 should be withdrawn.

In regard to paragraphs 17 and 18 of the Office communication, the rejection of claims 4 and 5 under 35 USC 103(a) as being unpatentable over Robb et al. and Mick et al as applied to claim 1 and further in view of either Russ, The Image Processing Handbook, 2nd Edition, or the Pratt, Digital Image Processing, 2nd Edition, is respectfully traversed.

Applicant acknowledges that normalized correlation is a basic form of correlation. Nevertheless, these claims are dependent upon claim 1 which, in turn, involve a different methodology and matching criteria from that taught in Robb et al. and Mick et al. taken individually or in combination. Accordingly, the rejection of claims 4 and 5 should be withdrawn.

In regard to paragraph 19, the rejection of claims 8 to 14 under 35 USC 103(a) as being unpatentable over Robb et al. and Mick et al as applied to claims 1 and 7 and further in view of Kenet et al, U.S. Patent No. 5,836,872, is respectfully traversed. The Nields reference referred to by the Examiner has been withdrawn based upon Applicants filing of an English translation of the priority document. Therefore, any reference or reliance on Nields cannot be the basis of a rejection of any claims. Claims 8 to 14 are dependent claims that depend from claim 7. Claim 7 teaches a different methodology and matching criteria from that taught in Robb et al. and/or Mick et al for the reasons given heretofore relative to claim 1. The shape, contrast or gradient characteristics are used in claim 8 to determine the second set of numerical values. This is not used in Kenet et al. for this purpose. Claim 8 is considered patentably distinct since Kenet et al. does not teach the method of claim 7 for locating an element of interest and its teaching of the use of surface characteristics is not for the purpose of determining a set of numerical gray scale values. Claims 9, 10, 12 and 14 are dependent claims as is claim 11 that for the reasons given heretofore are clearly patentable over Robb et al. and Mick et al. For all of the above reasons, claims 8 to 14 are believed patentable over the cited references.

In regard to paragraph 20 of the Office communication, the rejection of claims 16 to 19 and 21 under 35 USC 103(a) as being unpatentable over Robb et al. is respectfully traversed. Claim 16 has been amended to clarify the function of the third stereotaxic image of the candidate pixel of step (d). In step (e), it is the position of a projected pixel in the third stereotaxic image

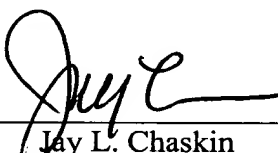
which is determined corresponding to the projection into the third stereotaxic image of the candidate pixel. Thereafter, a second automatic matching is made (step f) between the target region of interest and a vicinity of the projected pixel that permits a projected region of interest to be defined as called for in step (g). This methodology is not practiced in Robb et al. nor suggested. Instead, Robb et al. employs an extraction step to extract object contours from both the base and matched images using well-known image segmentation algorithms. Moreover, claim 16 not only employs a third stereotaxic image of the candidate pixel but also claims the step of determining of the position of a projected pixel in the third stereotaxic image (step c) followed by an automatic matching between the target region and a vicinity of the projected pixel (step f) to permit a projected region of interest to be defined (step g). There are no corresponding steps in Robb et al.

For all of the above reasons, claims 16-19 and 21 are believed to be patentable over Robb et al.

Reconsideration and allowance of claims 1-21 is respectfully solicited.

Respectfully submitted,

MULLER ET AL.

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